

Message

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Sent: 4/29/2019 4:25:51 PM
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Subject: Cross-Cutting Issues News for April 29, 2019



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Highlights

READING THE NEWS

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ENERGY AND NATURAL RESOURCES

Trump Offshore Drilling Delay Ramps Up Talk of Permanent Ban

By Chuck McCutcheon

The Trump administration's delay in plans to expand offshore oil drilling has emboldened opponents who want Congress to enact a permanent ban.

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FROM THE STATES

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Redefining EPA

Overhauling an agency and its mission

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Latest News

EPA Approval Of Texas 'Affirmative Defense' Hints At National Policy Shift

EPA is proposing to approve Texas' plan to offer an "affirmative defense" shielding companies from certain Clean Air Act enforcement actions when air law violations are due to unplanned events, suggesting a possible shift in national policy from the Obama administration's general prohibition on states being able to offer the waiver.

Judge Pledges To Set 'Reasonable' Deadline For EPA Landfill Methane Rule

A federal judge is promising to set "reasonable" deadlines for EPA to implement a long-delayed Obama-era rule to limit methane, the potent greenhouse gas, from existing landfills to account for federal resource constraints while rejecting Trump administration arguments that seek to set a new bar limiting states' standing to sue over climate rules.

Daily Feed

Keystone foes seek to preserve push for new NEPA review

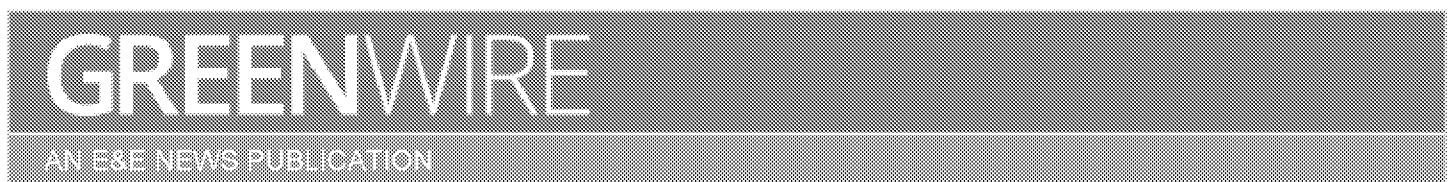
Environmentalists are seeking to retain an existing injunction on construction activities related to the controversial Keystone XL tar sands pipeline to leverage their claim the project requires an environmental review.

Ewire: Biden joins 2020 field but climate platform unclear

In today's Ewire: Former Vice President Joe Biden has called climate change the most important issue facing the country, though the precise outlines of his climate policy stance remain unclear.

Western states, utilities advance low-carbon power goals

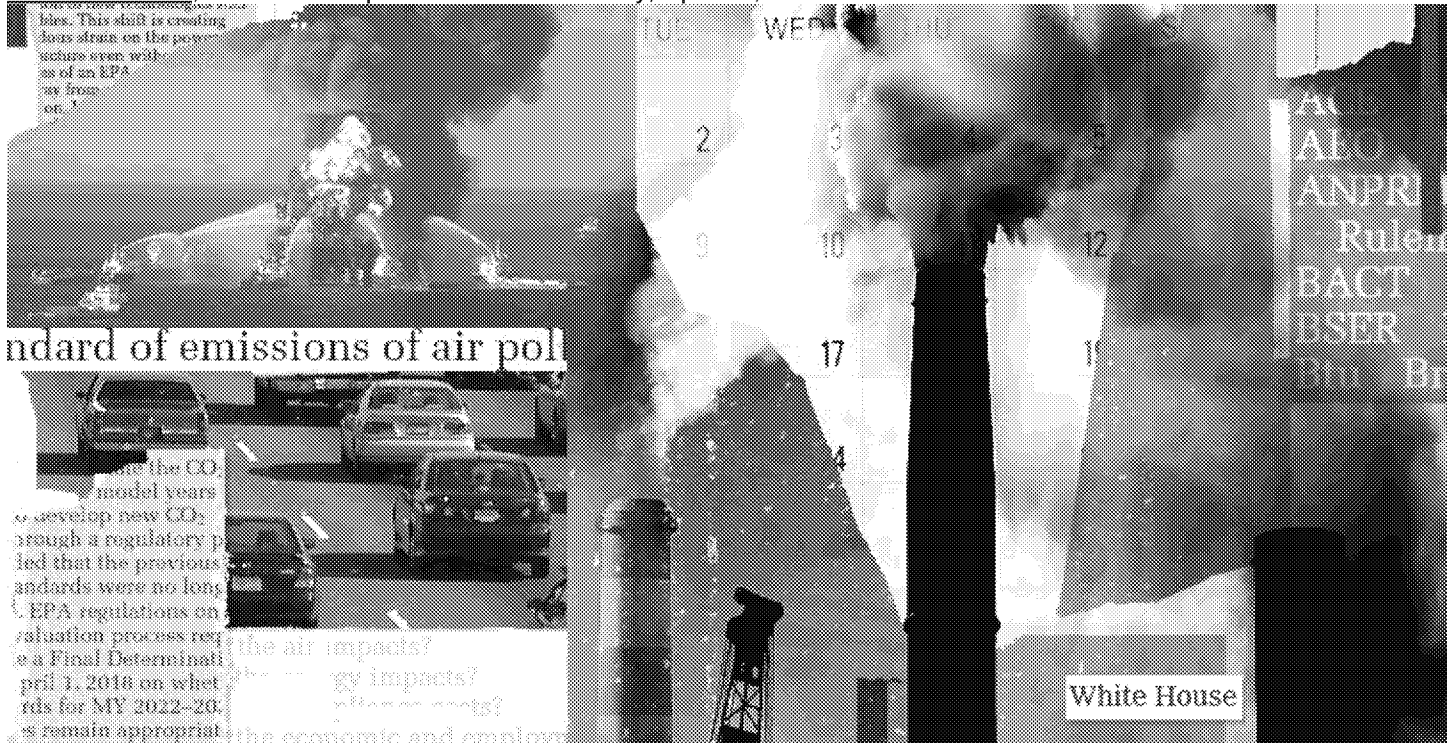
Lawmakers in Washington and Nevada are adopting stronger low-carbon standards for the power sector, while New Mexico's largest utility says it can beat a new state deadline to eliminate its carbon emissions..



FEDERAL AGENCIES

These 5 rules could be coming soon

Niina Heikkinen, E&E News reporter Published: Friday, April 26, 2019



The Trump administration has yet to complete a number of high-profile regulatory changes the president has promised. Claudine Hellmuth/E&E News(illustration); Chris McInnis and Dave Sizer/Flickr(smoke stack); US Coast Guard(Deepwater Horizon); Minesweeper/Wikipedia(cars); RawPixel(calendar); Federal Register(documents)

From greenhouse gas emissions controls to offshore drilling, the Trump administration has yet to complete a number of high-profile regulatory changes the president has promised.

Regulatory experts are closely tracking forthcoming final and draft rules and guidance documents in the second half of the presidential term.

"There are a lot of the things we expect to see relatively soon," said Hana Vizcarra, a staff attorney at Harvard Law School who works on Harvard's Regulatory Rollback Tracker. She and Caitlin McCoy, a climate, clean air and energy fellow at Harvard Law School, and other regulatory experts flagged half a dozen actions to keep an eye on as agencies push to complete regulatory rollbacks.

These actions could be made public in the coming weeks and months, based on deadlines projected by agencies, and the dates the rules have gone to the White House Office of Information and Regulatory Affairs for review, a key step toward completing the regulatory process.

Interior's blowout preventer and well-control rule



The Deepwater Horizon rig exploded in 2011, killing 11 rig workers and causing the nation's largest oil spill. U.S. Coast Guard

This rule from the Bureau of Safety and Environmental Enforcement makes changes to safety standards for offshore oil and gas drilling that were put in place to prevent a repeat of the 2010 Deepwater Horizon explosion and oil spill.

The new proposal more closely matches the oil industry's own safety standards, a move BSEE defended by saying the proposed changes do not ignore or contradict any of the safety recommendations made to BSEE right after the deadly disaster.

They have also argued that the changes are "reducing unnecessary burdens" to the industry (*Energywire*, Jan. 7).

BSEE sent the proposal to OIRA for review on Dec. 13, 2018.

White House guidance on greenhouse gas emissions



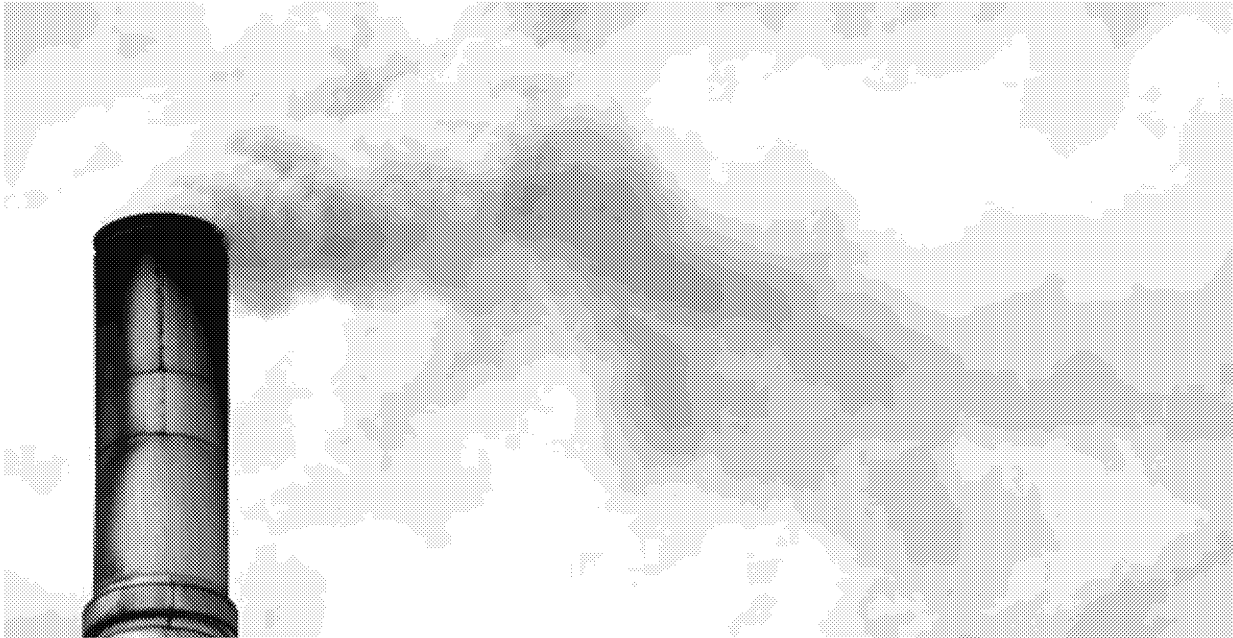
Regulatory experts are waiting for replacement guidance from the White House Council on Environmental Quality on how to consider greenhouse gas emissions under the National Environmental Policy Act. Sean Hayford Cleary/Flickr

Ever since the Trump administration in March 2017 rescinded Obama-era Council on Environmental Quality guidance on how to consider greenhouse gas emissions under the National Environmental Policy Act, regulatory experts have been waiting for a replacement document.

The new guidance is expected to revise the degree to which projects funded or built by the federal government have to consider greenhouse gas emissions in their assessment of environmental impacts of those projects. Of particular interest is how CEQ will say federal agencies should consider indirect emissions linked to projects ([Greenwire](#), Feb. 8).

The guidance progressed after the Senate confirmation of Mary Neumayr to lead CEQ in January. A month later, on Feb. 6, the guidance went to OIRA for review.

EPA's 'once in, always in' proposal



EPA is moving to formalize 2018 guidance on how sources of hazardous air pollutants must manage their emissions over time under the Clean Air Act. Ian Barbour/Flickr

The agency is seeking to formalize its 2018 guidance on how sources of hazardous air pollutants must manage their emissions over time under the Clean Air Act.

Under a 1995 memo, once "major sources" of hazardous air pollutants were given that designation, they would continue to be subject to the control standards of major sources.

With the new proposal, major sources that are able to reduce their hazardous air pollutant levels below a certain threshold could be reclassified as "area sources." This change would require them to use a different set of emissions control standards.

EPA sent the proposal to OIRA on Feb. 25.

A Justice Department attorney representing EPA said to expect a final rule in June ([Greenwire](#), April 1).

EPA and the Department of Transportation's clean car rule



The Trump administration is fighting states and environmentalists over clean car rules. David Wilson/Flickr

The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule by EPA and the National Highway Traffic Safety Administration would freeze fuel economy standards put forward by the Obama administration at 2026 levels and would prevent California from setting stricter tailpipe emissions standards.

The rule does not appear to have landed at OIRA yet, but EPA Administrator Andrew Wheeler said during the Washington Auto Show earlier this month that the agencies are aiming to finalize it by spring or early summer (*Greenwire*, April 4).

Reuters, citing two unnamed officials, stated in an April 11 [article](#) that the rule would be out in mid-June.

The rule may also be beat out by another EPA measure on a very similar timeline: the Trump administration's rule on greenhouse gas emissions from existing power plants, said Jessica Wentz, a senior fellow at the Sabin Center for Climate Change Law at Columbia Law School, who maintains the Climate Deregulation Tracker.

EPA's Affordable Clean Energy rule



The Dave Johnston power plant in Glenrock, Wyo. PacifiCorp

This replacement for the Obama administration's Clean Power Plan would rely on efficiency improvements at the facility level to reduce carbon emissions of power plants.

The Trump administration had initially planned to release the rule in the first quarter of this year in its Unified Agenda, but work on the final rule was halted during the partial federal government shutdown, pushing back the final timeline of the rule (*Greenwire*, Jan. 25).

In a March 11 court filing to the U.S. Court of Appeals for the District of Columbia Circuit, the agency said it expects the rule to be finished this quarter. Some agency observers say the rule is rumored to come out in June.

But finalizing the rule by then could be a challenge, said Dan Bosch, director of regulatory policy at the American Action Forum.

"Since a final draft is not yet under review at OIRA, they would have to really hustle to release it by June. They would likely have to have a draft over to OIRA in the next week or two to have a chance to meet that target," Bosch said in an email last week.

Interior's five-year plan for offshore drilling



An offshore production platform in the Gulf of Mexico. Katie Howell/E&E News

Regulatory experts had also been closely tracking the fate of the Interior Department's highly controversial proposal to move ahead with offshore drilling in the Atlantic, Pacific and Arctic oceans.

Now, the Interior Department says the proposal will be delayed indefinitely due to a recent federal appeals court decision (*E&E News PM*, April 25).

The Bureau of Ocean Energy Management's draft plan released in January 2018 would have opened more than 90% of the outer continental shelf to oil leasing and would offer 47 lease sales between 2019 and 2024 (*Greenwire*, Jan. 4, 2018).

The Trump administration had working on a revised proposal; it brought in staff during the government shutdown to work on it.

But last month, the D.C. Circuit had reinstated the Obama administration's restrictions on offshore drilling in parts of the Arctic and Atlantic oceans (*Energywire*, April 1).

Interior Secretary David Bernhardt yesterday told the *Wall Street Journal* that BOEM would wait for the case to complete the appeals process before proceeding with work on the proposal.

OFF TOPIC

What's so funny about climate change? This guy will tell you

Maxine Joselow, E&E News reporter Published: Friday, April 26, 2019



Josh Willis, a climate scientist at NASA's Jet Propulsion Laboratory, moonlights as a comedian. Josh Willis.

Josh Willis is a climate scientist by day.

By night, he's a comedian who tells jokes about a subject few other comics would dare touch: global warming.

At small theaters across Los Angeles, he regularly riffs on polar bears, melting ice caps and other symbols of a warming planet.

E&E SERIES



Energy and environmental newsmakers dish on politics, pet peeves and their TV addictions. [Click here](#) to read more stories in this series.

"It is kind of a scary subject. But I think laughter gives us the permission to do something about it," Willis said in a recent interview.

"I mean, in a way, jokes are a way of making fun of our own failures as humans," he said. "And right now, we're failing pretty hard in terms of dealing with climate change."

After obtaining a graduate degree from the Scripps Institute of Oceanography, Willis went to work for NASA's Jet Propulsion Laboratory in Pasadena, Calif.

But something was missing from his life. And one day, after watching a comedy troupe perform on a cruise ship, he realized what it was.

Now, his comedy has bled into his work at NASA, where he named a project Oceans Melting Greenland — or OMG for short.

Willis recently spoke with E&E News about making global warming funny, interacting with climate change deniers and his dream of making a movie with Will Ferrell someday.

When did you first become interested in comedy?

So I've always loved a good joke, and I like to tell 'em. But I didn't really start studying comedy until about seven years ago, well after I was established as a climate scientist and had finished my Ph.D. in oceanography at the Scripps Institute of Oceanography.

What sparked your interest?

It's kind of a funny story. I was on a cruise ship with my wife, and there was a Second City troupe there performing, and I kind of fell in love with what they were doing. It was amazing. So I went and talked to the director after one of the shows.

I told him that I was a climate scientist and I was in desperate need of comedic assistance because I wanted to make global warming funny. And he said, "Well, here's a business card. When you get back to Los Angeles, take a class at the Second City School of Improv in Hollywood." I did, and I fell in love with it and have been doing it ever since.

Why did you want to tell jokes about climate change?

I realized that if I could make climate change funny and engaging, then people would be more receptive to it. And they would be more likely to come away feeling like it isn't this hopeless, desperate, impossible situation. And it's not hopeless, but we do have to do something about it. So I think it puts people in the right frame of mind to think about it.

Is it a daunting subject?

It is kind of a scary subject. But I think laughter gives us the permission to do something about it. I mean, in a way, jokes are a way of making fun of our own failures as humans. And right now we're failing pretty hard in terms of dealing with climate change. So I hope that laughing about it can help people change and find a path forward.

Where do you usually perform?

Mostly small venues in Los Angeles. I do storytelling and improv — so making up stories and scenes — and then some sketch comedy, as well.

Do your colleagues at NASA know about your comedy?

Well, I was slow to tell my colleagues that I was doing this because my colleagues are a bunch of stiff.

I'm just kidding. But it is a different world. In science, we try to say things in a way that's very exact and that really only a few of our colleagues understand. And jokes are a language everyone understands, so we're kind of speaking two different languages.

But since I told them, I've mostly gotten support from my colleagues. I think most of them enjoy a good laugh and are happy to see someone out there trying to talk about climate change in a unique way.

What are you currently working on at NASA?

I'm currently working on a project called Oceans Melting Greenland, or OMG.

Did you pick the name to be funny?

I actually did pick the name the year I was taking my first improv classes at Second City, so it definitely had an influence on me.

What does the project entail?

Basically, it's an airplane mission. So we fly around in airplanes and measure the temperature of the oceans and the condition of the ice. We're trying to figure out how much warming temperatures are causing Greenland to lose ice around its edges, where it's touching the water.

Is OMG your primary focus at NASA?

Yes, it is one of the two primary focuses. The other one is the satellites that actually measure sea-level rise.

So I'm the lead NASA scientist for the Jason missions, which look down from space and measure how tall the ocean is using radar. This tells us about global sea-level rise and ocean currents and a whole bunch of other things like El Niño.

Are there certain aspects of climate change that are often misunderstood?

Yes. I think a line that's very difficult to walk is the difference between weather and climate. Every time it's really cold, people who think there's no climate change go, "Ah, see, there's no climate change."

President Trump has tweeted that cold weather disproves climate change.

You know, as a NASA employee, I can't say that I don't like what the president is saying. But what I can say is that there's a lot of misinformation out there. And it comes from all over, and it's repeated by people throughout the government.

This is a problem because it gives people permission to avoid action. Even if you kind of know it's happening, and even if you kind of know it's important, somebody just outright denying it gives you permission to not do anything about it.

Do you ever interact with people who deny mainstream climate science?

Oh, sure. In Los Angeles, I'm mostly in smaller theaters, so I don't get too many folks who think climate change is a bunch of hooey. But online and in emails and in public lectures, absolutely. I run across tons of people who are convinced it's all a big scam.

What do you say to them?

Well, some people feel like their livelihood is tied up in continuing to burn fossil fuels. And with folks like that, you can't just go, "Oh, fossil fuels are bad, we can't ever burn any fossil fuels anymore." To somebody who worked in a coal mine or an oil field, that's hard to wrap your head around because your whole job and livelihood are dependent on this.

We can't dismiss folks like that. And you have to talk to them about what's bothering them instead of whether global warming is real or not. You know, they're not saying all climate scientists are liars. What they're saying is "I'm scared for my job" or "I'm scared for my livelihood" or "I don't know how we can do this without upending my whole worldview."

What is your family like?

I have a wife. We met in college. She's a doctor. And I don't have any kids.

Do you talk about climate change with your wife?

Yes. She's also my chief comedic writer. She helps with the jokes about climate change sometimes. If she doesn't think they're funny, they go in the trash right away.

You told NBC Washington that you hope to make a movie about climate change with Will Ferrell someday. Is that still true?

Yes. You've got to put your pipe dreams out there. You know, you got to dream big in this town. But I said that because that's the level of funny we should bring to climate change. Will Ferrell is a hilarious actor. He brings a level of childish silliness and wonder to subjects that I think deserve it. And I think climate change definitely deserves it.

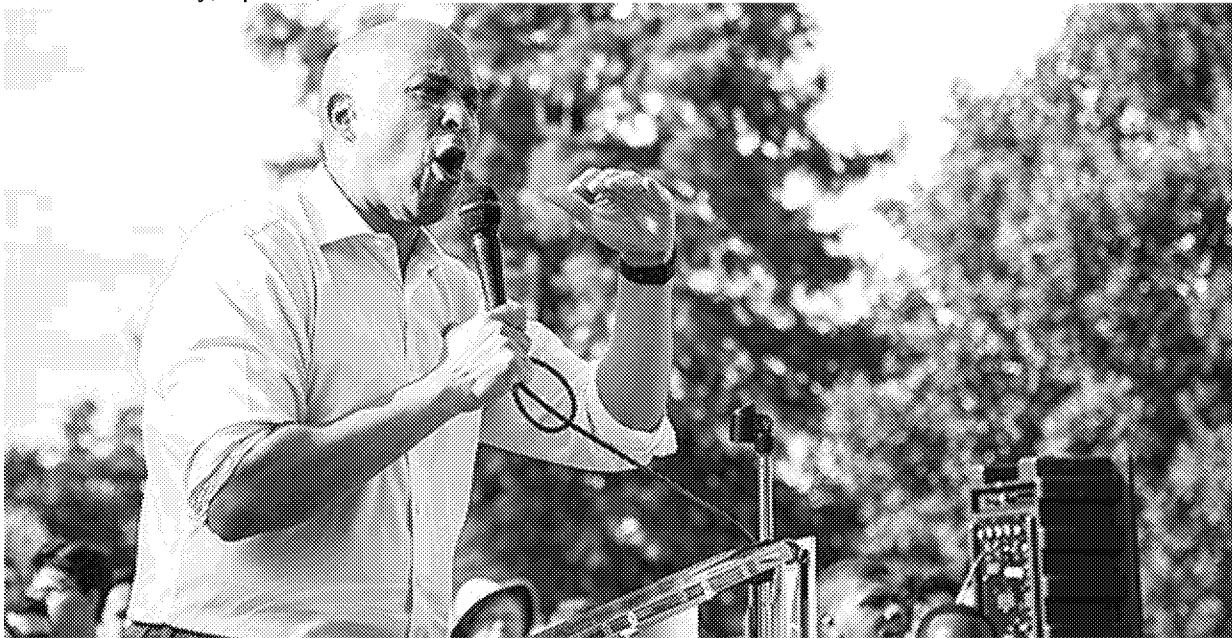
This interview has been edited and condensed for clarity.

CAMPAIGN 2020

Booker unveils plan to expand EPA fees, enforcement

Timothy Cama, E&E News reporter

Published: Friday, April 26, 2019



Sen. Cory Booker (D-N.J.). Mobilus in Mobilis/Flickr

Democratic presidential hopeful Cory Booker unveiled a plan for EPA today aimed at boosting the agency's power to punish polluting companies, increasing the fees on industries responsible for pollution and better addressing minority communities' unique plights.

Booker framed his plan as part of an environmental justice agenda, fitting into his current "Justice for All" tour, which included multiple stops in South Carolina, where he planned today to talk about EPA.

The New Jersey senator, who has long sat on the Environment and Public Works Committee, accused President Trump of being derelict in his duties to protect the environment and public health at EPA.

"The Trump administration has gutted the EPA, rolled back clean air and clean water protections, and allowed polluters to go unchecked, causing immense harm and suffering by vulnerable communities," Booker said in a statement.

"We cannot and will not stand by while polluters poison our children and make our air unbreathable. This injustice must end," he said. "As president, I would take immediate steps to protect and defend struggling families by strengthening the EPA's enforcement power, forcing those responsible for pollution to pay for cleanup and abatement, and putting an end to the poisoning of communities like mine in Newark and so many in South Carolina."

Booker is the only sitting senator who lives in an inner-city, majority-black neighborhood, and has made that central to his campaign. The decadeslong pollution problems in Newark and other areas of New Jersey have given him a post both in the Senate and in the presidential race to prioritize environmental protection.

It is the most in-depth environmental justice plan yet among the Democrats vying for the White House in 2020. Booker is also a co-sponsor of the Green New Deal, along with the five other Senate Democrats in the presidential race.

Many of Booker's proposals would require Congress to act, particularly those that would increase fees.

A centerpiece to Booker's plan for EPA is an expansion of a legislative proposal he has long championed: He would reinstate and triple the so-called Superfund tax that once charged oil and chemical companies for the products they produced. Before expiring in 1990, that tax went into a fund for cleaning up contaminated areas that were abandoned.

Booker would also make paint companies pay to clean up lead paint in a way he did not specify, and extend and double the fees paid by mine operators, with a goal of cleaning up all the nation's abandoned mines.

A number of Booker's proposals center on boosting enforcement of EPA's laws, which he accused Trump of abandoning. He would increase tenfold the staffing levels at EPA's environmental justice and civil rights enforcement offices, double staff at all EPA enforcement offices, and boost enforcement resources for drinking water standard violations.

Booker also wants EPA officials to consider current pollution levels in areas before signing off on air or water emission permits, in an effort to avoid exacerbating the problems, particularly in minority communities.

EPA

Pruitt's Superfund guy hunts for job in his hometown

Mike Soraghan, E&E News reporter

Published: Friday, April 26, 2019



Albert "Kell" Kelly advised former EPA Administrator Scott Pruitt on reforming the Superfund program. Oklahoma State Home Builders Association

Albert "Kell" Kelly, the banished banker once tasked with overhauling Superfund for the Trump administration, might soon have a new government position — city attorney in his hometown of Bristow, Okla.

Kelly has returned to his hometown, population 4,200, and hung his shingle on the town's Main Street. He partnered with Joe Sam Vassar, the departing city attorney, and applied for the city position earlier this month.

His application letter makes no mention of his time as a senior adviser for fellow Oklahoman Scott Pruitt after Pruitt took charge of EPA.

"I have practiced law here, served as an assistant district attorney here, built a good bank over many years and now am back here to practice law and work for my hometown," Kelly wrote in his April 19 application letter to Bristow Mayor-elect Rick Pinson.

His chances seem good. Pinson wouldn't say whether Kelly will get the job but did say "Kell and I go way back."

In an emailed reply to messages, Kelly told E&E News he was "baffled" a news outlet would be interested in his current dealings.

"My focus has been with my children and grandchildren and in doing quite a lot of volunteer work to help my hometown of Bristow," he said.

Other members of Pruitt's team have also gone back to "Tulsa time." Ken Wagner, another Oklahoman who went to EPA with Pruitt, returned home to serve as secretary of energy and environment for Republican Gov. Kevin Stitt (*Energywire*, Nov. 28, 2018). Pruitt himself recently surfaced as a lobbyist for an Indiana coal company, with a Tulsa address (*Greenwire*, April 22).

Kelly's family has long roots in Bristow, which is located about half an hour southwest of Tulsa. Kelly's photo hangs in the town square, where plaques honor the town's "Pioneer Families."

His family has run SpiritBank since the Great Depression, when the business was called American National Bank of Bristow. The bank is now based in Tulsa, but it still has a stately building on Main Street on the way into town.

Kelly left as chairman of SpiritBank in April 2017 to help Pruitt make changes at Superfund, a program Pruitt viewed as a priority.

He was banned from banking by the Federal Deposit Insurance Corp. several weeks after joining EPA. FDIC asserted Kelly's actions showed his "unfitness to serve as a director, officer, person participating in the conduct" of a bank.

Though Kelly and the FDIC have never explained what led to the ban, documents obtained by E&E News indicate it stemmed from a soured 2010 real estate deal in another town on the outskirts of Tulsa — Claremore, Okla. (*Energywire*, Feb. 6, 2018).

Kelly has not responded to questions about the ban, but he told a Montana newspaper last year he couldn't afford to keep fighting the federal agency.

"When you run out of money, you have to take the best settlement you can," he told *The Montana Standard*.

Kelly began his efforts to "streamline" Superfund with a 30-day review of the program for Pruitt, which produced 42 recommendations for accelerating cleanups. They focused on getting companies to help pay for Superfund cleanups, either because they're responsible for the pollution or because they want to develop the sites.

Critics called it a plan to do cleanups on the cheap. But at least one activist praised Kelly for traveling to Superfund sites and talking extensively with those who lived nearby.

Scrutiny, however, focused more on his banking ban than on his cleanup plans. Democratic members of Congress pressed Pruitt on why he'd hired someone who'd been banned from his profession. The criticism was a small part of the barrage of allegations that drove Pruitt from office last summer.

Kelly resigned from EPA about a year ago, a few months before Pruitt's departure. Kelly told NPR he'd long planned to leave after a year and said the questions about the FDIC action weren't the reason for his resignation. But he acknowledged, "I do think that the continued barrage of press finally wears you down" (*Energywire*, May 3, 2018).

Members of Congress also raised questions about Kelly's interest in land adjacent to a Superfund site in Bristow. Kelly and his family own land all around Bristow, which is home to at least four contaminated sites (*Energywire*, Feb. 28, 2018).

Kelly was later criticized for staying in contact with SpiritBank officials after signing the ban while at EPA (*Energywire*, Feb. 12).

An FDIC spokeswoman said the agency wouldn't comment on whether someone in Kelly's situation could serve as an attorney for a city that has dealings with a bank. The order would appear to allow it, so long as Kelly is not "participating in any manner in the conduct of the affairs of any financial institution," as the order states.

CAMPAIGN 2020

O'Rourke might halt new oil and gas drilling on federal land

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Former Texas Rep. Beto O'Rourke said yesterday he's willing to consider a moratorium on new leases to drill for oil and gas on federal lands as a way to help combat climate change.

The Democratic presidential hopeful told reporters while campaigning in Nevada yesterday the nation needs to rethink how it protects its public lands and "keep them from being diminished in size as has happened under" the Trump administration.

O'Rourke said that concern, combined with the need to reduce total greenhouse emissions, makes it especially important that U.S. taxpayers don't allow oil and gas companies "to contribute more to the problem."

"So, rethinking the leasing of public lands and perhaps creating a moratorium on any future leases — and reviewing all those that are in existence — is in order," he told reporters after a speech to the University of Nevada Young Democrats at a packed coffee shop on the edge of the Reno campus.

"If we continue to add to the problem and do not invest in the solution, which is going to be renewable energy, then we will have squandered this limited time that is left to us," he said.

O'Rourke said federal procurement policies are one of the biggest tools the government has to bring change on many fronts.

"What we buy and from whom we buy, and in what form the energy is — to whom we lease and to whom we allow to use federal and national lands — we should be the biggest player in the change that we know that we need to produce," he continued.

O'Rourke campaigned in Las Vegas last month on his first visit to the early caucus state. But it was the first time he'd appeared in northern Nevada. Later yesterday, he spoke to a crowd of about 200 at a restaurant in Carson City, including climate change as one of his themes along with immigration, health care and the economy.

O'Rourke said he's glad former Vice President Joe Biden formally announced yesterday that he too is seeking the 2020 Democratic presidential nomination.

"He is joining an extraordinary field of candidates with amazing diversity and backgrounds and experience and life stories," he told reporters in Reno.

"I think he brings some extraordinary experience in public service to this and glad he's in the race," O'Rourke said. "I think it's good for our party, it's good for Democrats, good for America — so glad he's in." — *Scott Sonner, Associated Press*

FORESTS

Scientists prescribe controlled burns for Pacific Northwest

Marc Heller, E&E News reporter

Published: Friday, April 26, 2019



A Forest Service fire detailer watches smoke during a prescribed burn last year. Airman 1st Class Alex Echols/Air Force

Forest managers should significantly increase the use of prescribed fire in the dry forests of Oregon and Washington state, researchers said after studying the region's wildfire history.

Using computer models, researchers with the Forest Service, University of Idaho and Nature Conservancy said they've learned that low- and moderate-intensity fires were more frequent in those forests than previously thought and have been replaced with less-frequent but hotter fires that leave more damage.

"There's just a huge need for management in our forests," said Ryan Haugo, director of conservation science for the Nature Conservancy's Oregon chapter and lead author of the [study](#).

The study was published in the April 22 edition of *Ecosphere*.

According to the study, about 4 million acres of forest burned throughout the Pacific Northwest from 1984 to 2015. But under natural conditions, 10 times as many acres would have burned, the authors said. In Oregon and Washington's dry forests, as much as 18 million to 25 million acres of low-intensity fires were missing during the period, they said.

The reason, they said, is decades of forest policy aimed at keeping fire out of the forests, even though they're naturally adapted for fire. In the past, frequent fires removed woody fuel and fuel ladders — the mix of smaller and midsized trees that can feed a fire upward into the crowns of bigger trees — setting the stage for lower-intensity fires later, said Paul Hessburg, a research landscape ecologist with the Forest Service's Northwest Research Station in Wenatchee, Wash.

"When fire has been kept out of dry forests for the better part of a century or more, several natural fire cycles have been missed. So you can imagine that woody fuels have increased a great deal, as have fuel ladders created by seedlings, saplings and pole-sized trees that have seeded in during the fire-free interval," Hessburg told E&E News.

Researchers said that more of the fires that burned during that 32-year period were high-intensity, in which at least 75% of trees are killed. A low-intensity fire might kill up to 25% of trees.

The intensity of fires over time makes a difference in the makeup of the forest, researchers said. High-intensity fires can transition a forest from trees to shrubs or grassland, for instance, they said.

Haugo told E&E News that researchers aren't pressing for a return to natural conditions, as the forests have changed and become more developed, putting people and property at risk. But a more aggressive routine of managed low- and mid-intensity fire would make forests more resilient and reduce risk of catastrophic wildfires, he said.

The challenge is convincing the public to accept more fire, Haugo said. While prescribed burns have a long history in other regions, such as the Southeast, they're less established in the West, he said.

Much of the reason is people's discomfort with smoke and its associated health problems.

"Smoke is a huge concern," Haugo said. "There is no future in which we don't have smoke from fires in the Northwest."

Prescribed burns themselves pose management challenges, including knowing which trees to thin out before lighting a fire and what time of the year is best for burning. Wildlife has adapted to fires during summer, rather than spring, for instance.

Managed fires make the most sense in fall and spring, though, Hessburg said, because finer fuels like kindling will have dried out but bigger logs on the ground will still be moist and won't ignite; that gives forest managers an opportunity to reintroduce fire into the landscape, he said.

After off-season fire has been applied regularly, Hessburg said, managers might be able to bring fire back in summer, more closely mimicking nature.

WILDLIFE

Scientists discover 95M-year-old crab

Philip Athey, E&E reporter

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Artistic rendering of the *Callichimaera perplexa*, a 95-million-year-old chimera species. Elissa Martin/Yale Peabody Museum of Natural History

The discovery of a cartoonishly cute 95-million-year-old crab, which researchers have compared to an ancient platypus, may change the way most people think about crabs.

The quarter-sized creature, which boasts a wide range of unique features, is called *Callichimaera perplexa*, which means perplexing beautiful chimera. It was named for the mythological Greek creature made up of several different animal parts, as well as the difficulties it gave researchers.

"It was a nightmare for us," said Yale University paleontologist Javier Luque, who led the international team that published research on the crab Wednesday in *Science Advances*. He described his team as "CSI detectives," trying to determine the cause and purpose for the creature's different features.

Luque first discovered the crab, along with a trove of well-preserved specimens dating to the mid-Cretaceous Period, in 2005 while an undergraduate geology student on a research trip in the mountains of Colombia.

While seeking a break from the equatorial sun, he sat down and started breaking rocks, expecting to find a few interesting, if not unique, fossils. Instead he made the discovery of his career. The crab's huge exposed eyes, long tail, submarine-style body and large paddlelike claws likely made it an "active swimmer" and an "active predator," he said. The creature possibly used its big eyes to spot and hunt down smaller ocean creatures, Luque theorized.

What was more interesting to Luque, however, was not so much the discovery of a new crab, but the realization that one had existed in a completely different form from what we know today.

Compared with its modern cousins, the ancient crab has more in common with the larval stages than the fully grown adults.

All creatures "have to go from eggs ... to adults," Luque said, but "they are sets of adults that happened to retain their larval traits into adulthood."

The changes in developmental timing are a known scientific phenomenon referred to as heterochrony, which can lead to unique creatures such as the newly discovered crab.

According to the study, the chimera "illuminates the early disparity" of ancient crabs while challenging "conventional views of their evolution."

Luque looks forward to uncovering more about the ancient animals that lived during the mid-Cretaceous Period.

"This was an unexpected discovery," he said, "but it's just the tip of the iceberg."

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